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EXAMINER

SINGH, RAMNANDAN P

ART UNIT

PAPER NUMBER

2646

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/072,833

Applicant(s)

NORRELL ET AL

Examiner

Ramnandan Singh

Art Unit

2646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>(i) Jun. 27, 2002 and (ii) Dec. 01, 2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed on Dec. 01, 2005 have been fully considered but they are not persuasive.

(i) Applicant's argument---"The DSL repeater is also known as a loop extender because the amplifiers introduce gain in the DSL signals to extend the transmission range of the DSL signal" on page 18, lines 5-7.

Examiner's response—Examiner agrees.

(ii) Applicant's argument----"The DSL Repeaters of Figs. 4 and 5 do not include a plurality of upstream complex impedances or a plurality of downstream complex impedances, as recited in the claim" on page 18, lines 7-9.

Examiner's response----Examiner respectfully disagrees. In this respect, Applicant is directed to Figs. 5 and 6. Further, Tamble et al disclose: "Preferred embodiments of the invention can be identified one at a time by selecting a value for R or C and then collecting frequency response data while the other variable (C or R) is swept across a range" [Para: 0062]. Clearly, selecting a value for R or C in the complex impedance, as shown in Fig. 6, is equivalent to selecting one set of complex impedance from a multiple set of complex impedances. This is because one specific value of R or C determines one specific set of complex impedance as shown in Fig. 6. Thus, Tamble et al disclose a loop extender including a plurality of upstream complex impedances and a plurality of downstream complex impedances, as recited in the claim.

(iii) Applicant's argument---“In contrast, claim 31 recites “selectable line termination and equalization (SLTE) DSL amplification circuitry”, which includes a plurality of upstream complex impedances and a plurality of downstream complex impedances. For the reasons stated above, Tamble and Sommer, either alone or in combination, fail to teach or suggest all of the limitations of the claim. In particular, the cited references do not teach or suggest SLTE amplification circuitry having a plurality of upstream complex impedances and a plurality of downstream complex impedances” on page 22, lines 25-31.

Examiner's response---Examiner respectfully disagrees. Selecting a value for R or C in the complex impedance, as shown in Fig. 6, is equivalent to selecting one set of complex impedance from a multiple set of complex impedances. This is because one specific value of R or C determines one specific set of complex impedance as shown in Fig. 6. Thus, Tamble et al disclose a loop extender including a plurality of upstream complex impedances and a plurality of downstream complex impedances for selectable line termination and equalization (SLTE) amplification circuitry. Further, selecting a value of R or C in the complex impedance is for the purpose of matching a load [Para: 0037; 0046; 0073].

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-10 and 18-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Tambe et al [US 20020113649 A1].

Regarding claim 1, Tambe et al teach a system for improving transmission of Digital Subscriber line (DSL) signals over a local loop, the system comprising:

a loop extender capacitively coupled to the local loop, the loop extender including a plurality of upstream complex impedances (i.e. a combination of resistors, capacitors and inductors) coupled in parallel, a plurality of downstream complex impedances coupled in parallel [Fig. 6; Para: 0059-0063; Abstract]; and

a first upstream filter/amplifying element coupled to the plurality of upstream complex impedances and a first downstream filter/amplifying element coupled to the plurality of downstream complex impedances, wherein digital switches are provided [Figs. 4-5; Para: 0007; 0043-0058]. In this context, Tambe et al further disclose that preferred embodiments of the invention can be identified one at a time by selecting a value for R or C and then collecting frequency response data while the other variable (C or R) is swept across a range [Para: 0062]. Clearly, selecting a value for R or C in the complex impedance, as shown in Fig. 6, is equivalent to selecting one set of complex

impedance from a multiple set of complex impedances. This is because one specific value of R or C determines one specific set of complex impedance as shown in Fig. 6. Thus, Tamble et al disclose a loop extender including a plurality of upstream complex impedances and a plurality of downstream complex impedances, as recited in the claim [Para: 0016; 0059; 0063; 0075].

Claim 18 is essentially similar to claim 1 and is rejected for the reasons stated above.

Regarding claims 2-3 and 19-20, Tambe et al further teach the system, wherein selection of the plurality of complex upstream impedances to approximately is made (selection switches not shown) to match the local loop impedance (i.e. to compensate loss) in a first direction along the local loop [Fig. 6; Para: 0048; claims 29-30].

Regarding claims 4-5 and 21-22, the limitations are shown above.

Regarding claim 6, Tambe et al further teach the system, wherein at least one additional upstream filter/amplifying element coupled in parallel to the first upstream filter/amplifying element; and at least one additional downstream filter/amplifying element coupled in parallel to the first downstream filter/amplifying element [Figs. 4-5; Para: 0043-0048; 0056-0058].

Regarding claims 7-10 and 23-26, the limitations are shown above.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tambe et al as applied to claim 6 above, and further in view of Ashley [US 20020090026 A1].

Regarding claim 11, Tamble et al do not teach expressly a first transformer coupled to the plurality of upstream complex impedances and a second transformer coupled to the plurality of downstream complex impedances.

Ashley teaches a transceiver circuit shown in Figs. 2-3, comprising a line drive transformer (126) coupled a receive circuit (129) having upstream data (121A), and to a transmit circuit (123) having downstream data (122) , an inverter (146), switches [Para: 0024] and an amplifier (141) [Figs. 1-4; Para: 0009-0011; 0018-0036; claims 1-17]. It may, further, be noted that the Ashley's transceiver circuit comprising a single line drive transformer feeding both a receive part and a transmit part is equivalent to the Applicant's claimed system having two separate transformers.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Ashley with Tambe et al in order to enable a DSL system to reliably operate over long local loops [Ashley; Para: 0003].

Claim 27 is essentially similar to claim 11 and is rejected for the reasons stated above.

6. Claims 12-17 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tamble et al and Ashley as applied to claim 12 above, and further in view of Sommer et al [US 200200610058 A1].

Regarding claim 12, although Tamble et al teach coupling a POTS loading coil adapted to be coupled to the local loop, and power and control unit to the ADSL repeater 400 [Fig. 4; Para: 0044], they do not teach expressly coupling a diagnostic unit to the local loop.

Sommer et al teach using a health checking (i.e. diagnostic) unit (313) for transmitting a diagnostic signal [Fig. 7; Para: 0098-0100; 0016; 0112; Abstract].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Sommer et al with Tambe et al in order to combat the loss in the actual cable (subscriber loop) [Sommer et al; Para: 0048].

Claim 28 is essentially similar to claim 12 and is rejected for the reasons stated above.

Regarding claim 13, Sommer et al further teach the system wherein the diagnostic/control unit (313) includes: a modem [Para: 0058] coupled to the local loop for communication with a central office; an analog multiplexer/analog-to-digital converter (307) for controlling switches via switch control lines; and a diagnostic/control processor (i.e. microcontroller) coupled to the modem and processing control signals received [Sommer et al; Fig. 7; Para: 0099-0100; 0044; 0047; claims 1-23].

Claim 29 is essentially similar to claim 13 and is rejected for the reasons stated above.

Regarding claims 14-17 and 30, although the combination of Tambe et al , Ashley and Sommer et al do not teach expressly the various configurations of the DSL extender with switches and transformers as claimed, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use any configurations with switches and transformers in order to accommodate the need of the DSL extender to combat the loss in the subscriber loop subject to circuit, system, and design constraints.

7. Claims 31, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tambe et al [US 20020113649 A1] in view of Summer et al [US 20020061058 A1].

Regarding claim 31, Tambe et al teach a system for improving transmission of DSL signals over a local loop, the system comprising:

selectable line termination and equalization (SLTE) Digital Subscriber line (DSL) amplification circuitry capacitively coupled to the local loop via bypass relay switches (not shown) [Fig. 6]. Further, selecting a value for R or C in the complex impedance, as shown in Fig. 6, is equivalent to selecting one set of complex impedance from a multiple set of complex impedances. This is because one specific value of R or C determines

one specific set of complex impedance as shown in Fig. 6. Thus, Tamble et al disclose a loop extender including a plurality of upstream complex impedances and a plurality of downstream complex impedances for selectable line termination and equalization (SLTE) amplification circuitry. Further, selecting a value of R or C in the complex impedance is for the purpose of matching a load [Para: 0037; 0046; 0073]; and

a POTS loading coil (i.e. coil 621 and coil 622) adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop [ Figs. 4-6; Para: 0059-0063; Abstract].

Although Tamble et al teach coupling a POTS loading coil adapted to be coupled to the local loop, and power and control unit to the ADSL repeater 400 [Fig. 4; Para: 0044], they do not teach expressly coupling a diagnostic unit to the local loop.

Sommer et al teach a diagnostic/control unit coupled to the local loop for receiving and processing control signals from a central office using a health checking (i.e. diagnostic) unit (313) (switch control lines are not shown) [Fig. 7; Para: 0098-0100; 0016; 0112; Abstract].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Sommer et al with Tambe et al in order to combat the loss in the actual cable (subscriber loop) [Sommer et al; Para: 0048].

Claims 44 and 45 are essentially similar to claim 31 and are rejected for the reasons stated above.

8. Claims 32-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tambe et al and Sommer et al as applied to claim 31 above, and further in view of Ashley [US 20020090026 A1].

Regarding claim 32, Tamble et al teach the system comprising:

- a plurality of upstream complex impedances (i.e. a combination of resistors, capacitors and inductors) coupled in parallel;
- a plurality of downstream complex impedances coupled in parallel [Fig. 6; Para: 0059-0063; Abstract];
- a plurality of upstream filter/amplifying elements coupled in parallel and selectable [Fig. 5]; and
- a plurality of downstream filter/amplifying elements coupled in parallel, wherein digital switches are provided [Figs. 4-5; Para: 0007; 0043-0058; claim 1].

However, Tamble et al do not teach expressly a first transformer coupled to the plurality of upstream complex impedances and a second transformer coupled to the plurality of downstream complex impedances.

Ashley teaches a transceiver circuit shown in Figs. 2-3, comprising a line drive transformer (126) coupled a receive circuit (129) having upstream data (121A), and to a transmit circuit (123) having downstream data (122) , an inverter (146), switches [Para: 0024] and an amplifier (141) [Figs. 1-4; Para: 0009-0011; 0018-0036; claims 1-17]. It may, further, be noted that the Ashley's transceiver circuit comprising a single line drive transformer feeding both a receive part and a transmit part is equivalent to the Applicant's claimed system having two separate transformers.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Ashley with the combination of Tambe et al and Sommer et al in order to enable a DSL system to reliably operate over long local loops [Ashley; Para: 0003].

Regarding claim 33, although the combination of Tambe et al , Ashley and Sommer et al do not teach expressly the various configurations of the DSL extender with switches and transformers as claimed, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use any configurations with switches and transformers in order to accommodate the need of the DSL extender to combat the loss in the subscriber loop subject to circuit, system, and design constraints.

Regarding claims 34-43, the limitations are shown above.

***Conclusion***

**9. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2646

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ramnandan Singh  
Examiner  
Art Unit 2646



  
**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**